ordinary conditions. This ejector is built by Messrs. Willans & Robinson, Ltd. (English Electric Co., Ltd.), and fig. 24 shows it in section. The operating water is generally taken from the discharge side of the main circulating pumps, and the water in passing through the inlet cone increases in velocity, and is given a whirling motion by the fixed blades in the conical nozzle set at an angle to the axis of the nozzle. For constructional purposes these blades are attached to a central spindle, tapered at the top and bottom to reduce the resistance to the flow to the lowest possible value. The entrainment and discharge of the air is then effected in much the same manner as in the Worthington pump. Either the whole of the circulating water is allowed to pass through the ejector before entering the condenser (series system), or only a portion of the water is used in the ejector (shunt system) and is returned to the suction culvert or pipe. In any case it is found that the head of water available between the inlet and the outlet should not be less than about 16 ft., or the action is likely to be unstable.

Should the water pressure fall below that required to give proper discharge of the air and water through the diffuser there would be some danger of the water being drawn into the condenser and then into the main turbine, unless such an accidental flooding were guarded against. For this purpose an aluminium flap valve is placed between the ejector and the condenser, and is supported on a steel spindle resting on knife-edges to reduce friction. So long as the pressure at the ejector is lower than that in the condenser the valve remains fully open, but should the ejector fail and the pressure rise, the valve closes, due to the reversal of the current of air and vapour, and the communication to the condenser is thereby cut off. To prevent a large back-rush of water up the diffuser, should the valve close, which might break such a light valve by water-hammer action, a vacuum breaker is introduced in the position shown in fig. 24 in order to anticipate somewhat the action of the flap valve. A pipe P places the under side of the vacuum-breaker valve in communication with the water inlet to the

ejector, and unless the pressure of the water falls unduly this valve is thereby kept closed. But should the water pressure fall to a point which would render the ejector liable to fail, as might occur if something went wrong with the pump, the spring on the top of the valve opens it and allows air to flow into the ejector from the atmosphere. If the turbine is allowed to continue running under these conditions the pressure in the condenser would rise quickly to atmospheric pressure, and then the automatic atmospheric valve connected to the turbine exhaust would open and allow the exhaust steam to flow to the atmosphere through the atmospheric exhaust main. If the pressure of the water at the ejector inlet again became normal, the vacuum breaker would close and the ejector would again begin to produce a vacuum, and then the automatic atmospheric valve would close, allowing the condenser vacuum to build up again. The vacuum breaker valve in fig. 24 is shown in the open position, but with normal running conditions would, of course, be in the closed position.

Steam Ejector Air-pumps.—With the Parsons turbine a steam jet